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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,079	06/25/2003	Leo Zhaoqing Liu	Rhodia.02036 us	6545

110 7590 09/13/2005

DANN, DORFMAN, HERRELL & SKILLMAN  
1601 MARKET STREET  
SUITE 2400  
PHILADELPHIA, PA 19103-2307

EXAMINER

WHITE, EVERETT NMN

ART UNIT	PAPER NUMBER
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1623

DATE MAILED: 09/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/607,079

Applicant(s)

LIU ET AL.

Examiner

Everett White

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 June 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 21-37 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 21-37 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 25 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. The amendment filed June 22, 2005 has been received, entered and carefully considered. The amendment affects the instant application accordingly:

- (A) Claims 1-20 were previously canceled;
- (B) Claims 21-37 have been amended;
- (C) Comments regarding Office Action have been provided drawn to:
  - (I) Claim objections, which have been withdrawn;
  - (II) 112, 2<sup>nd</sup> paragraph rejections, which have been withdrawn;
  - (III) 102(b) rejections, which are maintained for the reasons of record;
  - (IV) 103(a) rejection, rendered moot by new ground of rejection over newly cited US Patent.

2. Claims 21-37 are pending in the case.

3. The text of those sections of Title 35, U. S. Code not included in this action can be found in a prior Office action.

#### ***Claim Rejections - 35 USC § 112***

4. Claim 33 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 33 does not set forth proper Markush terminology, which renders the claim indefinite. In Claim 33, line 2, the phrase "is selected from" should be changed to - - is selected from the group consisting of - -.

#### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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6. Claims 29-34 stand rejected under 35 U.S.C. 102(b) as being anticipated by Garnett et al (US Patent No. 3,522,158) for the reasons set forth on page 3 of the Office Action mailed February 23, 2005.

7. Applicant's arguments filed June 22, 2005 have been fully considered but they are not persuasive. Applicants argue that the rejection of the claims as been anticipated by the Garnett et al patent should be withdrawn because the Garnett et al patent does not disclose a grafted polysaccharide that has a molecular weight lower than the molecular weight of the ungrafted polysaccharide. This argument is not persuasive since the text in Claim 29, the independent claim, which recites "the grafted polysaccharide having a molecular weight lower than the molecular weight of the ungrafted polysaccharide" is based on a process limitation. Applicants are reminded that process limitations cannot impart patentability to a product that is not patentably distinguished over the prior art. *In re Thorpe et al.* (CAFC 1985), supra; *In re Dike* (CCPA 1968) 394 F2d 584, 157 USPQ 581; *Tri-Wall Containers, Inc. v. United States et al.* (Ct Cls 1969) 408 F2d 748, 161 USPQ 116; *In re Brown et al.* (CCPA 1972) 450 F2d 531, 173 USPQ 685; *Ex parte Edwards et al.* (BPAI 1986) 231 USPQ 981. Accordingly, the rejection of Claims 29-34 under 35 U.S.C. 102(b) as being anticipated by Garnett et al patent is maintained for the reasons of record.

8. Claims 29, 35 and 36 stand rejected under 35 U.S.C. 102(b) as being anticipated by Restaino et al (US Patent No. 3,461,052) for the reasons disclosed on pages 3 and 4 of the Office Action mailed February 23, 2005.

9. Applicant's arguments filed June 22, 2005 have been fully considered but they are not persuasive. Applicants argue that the rejection of the claims as been anticipated by the Restaino et al patent should be withdrawn because the Restaino et al patent does not disclose a grafted polysaccharide that has a molecular weight lower than the molecular weight of the ungrafted polysaccharide. This argument is not persuasive since the text in Claim 29, the independent claim, which recites "the grafted polysaccharide having a molecular weight lower than the molecular weight of the ungrafted polysaccharide" is based on a process limitation. Applicants are reminded

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that process limitations cannot impart patentability to a product that is not patentably distinguished over the prior art. *In re Thorpe et al.* (CAFC 1985), supra; *In re Dike* (CCPA 1968) 394 F2d 584, 157 USPQ 581; *Tri-Wall Containers, Inc. v. United States et al.* (Ct Cls 1969) 408 F2d 748, 161 USPQ 116; *In re Brown et al.* (CCPA 1972) 450 F2d 531, 173 USPQ 685; *Ex parte Edwards et al.* (BPAI 1986) 231 USPQ 981. Accordingly, the rejection of Claims 29, 35 and 36 under 35 U.S.C. 102(b) as being anticipated by Restaino et al patent is maintained for the reasons of record.

10. Claims 29, 33, 34 and 37 stand rejected under 35 U.S.C. 102(b) as being anticipated by Chuang et al (US Patent No. 4,831,097) for the reasons disclosed on pages 3 and 4 of the Office Action mailed February 23, 2005.

11. Applicant's arguments filed June 22, 2005 have been fully considered but they are not persuasive. Applicants argue that the rejection of the claims as been anticipated by the Chuang et al patent should be withdrawn because the Chuang et al patent does not disclose a grafted polysaccharide that has a molecular weight lower than the molecular weight of the ungrafted polysaccharide. This argument is not persuasive since the text in Claim 29, the independent claim, which recites "the grafted polysaccharide having a molecular weight lower than the molecular weight of the ungrafted polysaccharide" is based on a process limitation. Applicants are reminded that process limitations cannot impart patentability to a product that is not patentably distinguished over the prior art. *In re Thorpe et al.* (CAFC 1985), supra; *In re Dike* (CCPA 1968) 394 F2d 584, 157 USPQ 581; *Tri-Wall Containers, Inc. v. United States et al.* (Ct Cls 1969) 408 F2d 748, 161 USPQ 116; *In re Brown et al.* (CCPA 1972) 450 F2d 531, 173 USPQ 685; *Ex parte Edwards et al.* (BPAI 1986) 231 USPQ 981. Accordingly, the rejection of Claims 29, 33, 34 and 37 under 35 U.S.C. 102(b) as being anticipated by Chuang et al patent is maintained for the reasons of record.

***Claim Rejections - 35 USC § 103***

12. Claims 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garnett et al (US Patent No. 3,522,158, already of record) in view of Restaino et al (US Patent No. 3,461,052, already of record).

Applicants claim a method for grafting an unsaturated monomer onto a polysaccharide comprising the steps of: (1) forming a mixture comprised of an unsaturated monomer and a water soluble or water dispersible polysaccharide; (2) irradiating the mixture with an amount of electron beam radiation sufficient to form an unsaturated monomer-water soluble or water dispersible polysaccharide graft copolymer which is depolymerized relative to the ungrafted polysaccharide. Additional limitations in the dependent claims include specific unsaturated monomers and specific polysaccharides.

The Garnett et al patent discloses a process for the production of graft polymers by ionizing radiation, wherein a hydrophilic backbone polymer is irradiated in the presence of a solution of a monomeric vinyl compound (see abstract). See column 1, lines 41-46 of the Garnett et al patent wherein the backbone polymers include cellulose, any of its derivatives such as the aliphatic ethers and esters of cellulose which are hydrophilic, which embraces the instantly claimed water soluble and water dispersible polysaccharide. See column 2, 2<sup>nd</sup> paragraph of the Garnett et al patent wherein examples of monomeric vinyl compound are set forth which include styrene, methylmethacrylate, acrylonitrile, acrylamide, vinyl pyridines, vinyl carboxylic acids, and many others. The instantly claimed method differs from the process of the Garnett et al patent by claiming a depolymerization procedure. However, the Restaino et al patent shows that using radiation to produce graft copolymers wherein the radiation may also be used to depolymerize the polymers is known in the art. See column 3, 2<sup>nd</sup> paragraph wherein Restaino et al patent teaches that useful graft copolymers of cellulose degradation products may be obtained by employing higher radiation doses. The Restaino et al patent teaches variety types of polymers that may be subjected to radiation for the preparation of graft copolymers. See the sentence bridging columns 1 and 2 of the Restaino et al patent, which discloses that the polymers may be naturally

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occurring or may be of synthetic origin. Other examples of suitable polymers (or substrate materials) are set forth in the 1<sup>st</sup> paragraph of column 2. Also see the 2<sup>nd</sup> paragraph of column 2 for examples of vinyl monomers suitable for grafting to the substrates thereof.

One of ordinary skill in this art would be motivated to combine the teaching of the Garnett et al patent with the teaching of the Restaino et al patent since both patents set forth preparation of graft copolymers using radiation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to graft an unsaturated monomer such as vinyl compounds onto hydrophilic polymers such as a cellulose ether by irradiation as described in the Garnett et al patent wherein the irradiation also result in depolymerization of the graft cellulose product in view of the recognition in the art, as suggested by the Restaino et al patent, that use of radiation for depolymerization of graft cellulose products can be carried out at a specific setting to obtain useful graft copolymers.

13. Applicant's arguments with respect to claims 21-28 have been considered but are moot in view of the new ground(s) of rejection.

14. Claims 21-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Restaino et al (US Patent No. 3,461,052, already of record).

Applicants claim a method for grafting an unsaturated monomer onto a polysaccharide comprising the steps of: (1) forming a mixture comprised of an unsaturated monomer and a water soluble or water dispersible polysaccharide; (2) irradiating the mixture with an amount of electron beam radiation sufficient to form an unsaturated monomer-water soluble or water dispersible polysaccharide graft copolymer which is depolymerized relative to the ungrafted polysaccharide. Additional limitations in the dependent claims include specific unsaturated monomers and specific polysaccharides.

The Restaino et al patent discloses a process for the production of graft substrates by ionizing radiation, wherein a hydrophilic polymeric substrate is irradiated in the presence of a solution of a monomeric vinyl compound (see abstract). See

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column 2, 1<sup>st</sup> paragraph wherein suitable substrates materials are listed, which include cellulose, wool, starch, alginic acid and the alginates, vegetable gums such, for example, as locust bean gum, guar flour, or gum tragacanth, gelatin, casein, pectin, polyvinyl alcohol, hydrophile high molecular weight polyalkylene glycols, and the like. Suitable vinyl monomers are listed in the 2<sup>nd</sup> paragraph of column 2, which include vinyl acetate, acrylic acid and its esters, methacrylic acid and its esters, acrylamide, acrylonitrile, styrene, vinyl toluene, vinyl pyridine, alkyl vinyl pyridines, divinyl benzene, butadiene, N,N-methylene bis-acrylamide, and the like. The instantly claimed method differs from the process of the Restaino et al patent by claiming a depolymerization procedure. The Restaino et al patent also teaches using radiation to produce graft copolymers wherein the radiation may also be used to depolymerize the polymers. See column 3, 2<sup>nd</sup> paragraph wherein Restaino et al patent teaches that useful graft copolymers of cellulose degradation products may be obtained by employing higher radiation doses. The method for grafting an unsaturated monomer onto a polysaccharide of the instant claims differ from the process disclosed in the Restaino et al patent of grafting an unsaturated monomer onto a polymer and depolymerizing the polymer via radiation by setting forth in the claims that the depolymerized graft copolymer thereof has a molecular weight lower than the molecular weight of the ungrafted polysaccharide. One having ordinary skill in the art would have been motivated to employ the process of the prior art with the expectation of obtaining the desired product because the skilled artisan would have expected the analogous starting materials to react similarly. Accordingly, it would have been obvious to one of ordinary skill in the art at the time of applicants invention having the Restaino et al patent before him to use radiation to subject a graft copolymer to a desired size since Restaino et al teaches that useful graft copolymers of cellulose degradation products may be obtained by employing higher radiation doses.

15. Applicant's arguments with respect to claims 21-28 have been considered but are moot in view of the new ground(s) of rejection.



***Summary***

16. All the pending claims are rejected.

***Conclusion***

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

***Examiner's Telephone Number, Fax Number, and Other Information***


18. For 24 hour access to patent application information 7 days per week, or for filing applications, please visit our website at [www.uspto.gov](http://www.uspto.gov) and click on the button "Patent Electronic Business Center" for more information.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Everett White whose telephone number is (571) 272-0660. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson, can be reached on (571) 272-0661. The fax phone number for this Group is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-1600.

  
E.White

  
James O. Wilson  
Supervisory Primary Examiner  
**Technology Center 1600**